REMARKS

Claims 1-14, 16-37 are pending. By this Amendment, claims 16 and 18 are amended, and new claims 27-37 are added. Also, the abstract was amended to recite to the metal/metalloid sulfide particles and corresponding methods of the present claims.

The amendment of claim 16 is supported by the specification, for example, at page 19, line 30 to page 20, line 30. The amendment of claim 18 is supported by the specification, for example, at page 22, line 25-26. New claims 27-30 are supported by the specification, for example, at page 22, lines 2-9. New claims 31 and 34 are supported by the specification for example at page 24, lines 21-25. New claim 32 is supported by the specification, for example, at page 22, lines 29-31. New claim 33 corresponds with previous claim 23 written in independent form, which has been found allowable. New claims 35-37 correspond with claims 20-22. No new matter is introduced by the amendments or the new claims.

Claims 1-14 have been allowed. Applicants note with appreciation that claim 23 has been found allowable and is objected to for depending from a rejected base claim. Claim 23 was rewritten as new claim 33. Claims 16-22 and 24-26 stand rejected.

Rejection Under 35 U.S.C. § 112, First Paragraph

The Examiner rejected claims 16 and 17 under 35 U.S.C. § 112, first paragraph, for lack of written description as containing subject matter not described in the specification in such a way to reasonably convey possession of the claimed invention at the time of filing. With all due respect, Applicants' believe that the Examiner is reading certain parts of the text out of context. When reviewing the specification as a whole in context, Applicants believe that the claim terms are well supported.

The specification from page 18, line 19 to page 22, line 9 is a section referred to as "Heat Processing." The first section of this section states, "Significant properties of submicron and nanoscale particles can be modified by heat processing." In this context, the reaction to form a sulfide would certainly be considered a modification of a significant property. At the beginning of the description of the heating apparatus at page 20, line 30, the specification states " A variety of ovens or the like can be used to perform the heating." In context, this is clearly referring to the heating described in the section generally and not just to the specific heating reactions in the preceeding two paragraphs. Even if the dots are not 100% connected, a person of ordinary skill in the art would clearly understand that the intention of the heat treatment to form the sulfide would appropriately be performed in the apparatus just discussed. That is all that is required since the test for written description does not require the exact wording in the application.

Applicants assert that a person of ordinary skill in the art would certainly recognize at filing that Applicants' possessed the claimed invention. Thus, a prima facie showing of lack of written description has not been established. Applicants respectfully request withdrawal of the rejection of claims 16 and 17 under 35 U.S.C. § 112, first paragraph, for lack of written description.

Rejection Over Riman et al.

The Examiner rejected claims 18, 20, 21 and 25 under 35 U.S.C. § 103(a) as being unptatentable over U.S. Patent 6,699,406 to Riman et al. (the Riman patent). As a very minor point, Applicants note that the Office Action had a typographical error and listed the patent number as 6,699,409. The Examiner asserted that the Riman patent "teaches nanosized particles, which means the particles have a size of less than a micron. Accordingly, the reference teaches particles whose size overlaps the claimed range." With all due respect, Applicants maintain that this is not true. Furthermore, Applicants have amended claim 18 to more

particularly point out their claimed invention. Therefore, the Riman patent clearly does not render Applicants' claimed invention prima facie obvious. Applicants respectfully request reconsideration of the rejection based on the following comments.

While the interpretation of crystallite size as either a particle size or a grain size embedded within larger particles depends on the context, in the present context this issue is relatively clear. For example, at column 4, lines line 29, the Riman patent refers to their materials as "nanostructured." This implies that the particles have an internal structure, which implies that the crystallites are not particles. While the particles may be nanoparticles, there is no teaching of an average particle size less than 250 nm.

Furthermore, there is no teaching or suggestion of metal/metalloid sulfide particles having a crystallinity that results in crystal facets along the surface of the particles. This feature is presently claimed. Therefore, the Riman patent does not teach or suggest all of the claimed features of the composition.

Since the Riman patent does not teach or suggest the claimed average particle size or the claimed crystal facets along the surface of the particles, the Riman patent clearly does not render Applicants' claimed invention prima facie obvious. Applicants respectfully request withdrawal of the rejection of claims 18, 20, 21 and 25 under 35 U.S.C. § 103(a) as being unpatentable over the Riman patent.

Rejection Over WO 00/66485

The Examiner rejected claim 16 under 35 U.S.C. § 103(a) as being unpatentable over WO 00/66485 to Tenne et al. (the Tenne application). The Tenne application is directed to nanotubes of transition metal chalcogenides. The Examiner asserted on page 4 of the Office Action that "While the reference does not teach the reaction occurs with stirring, one of ordinary skillin the art would have found it obvious to stir during the reaction to ensure all particles are

exposed to the dihydrogen sulfide gas. The reference suggests the claimed process." With all due respect, Applicants maintain that the Examiner has failed to assert a prima facie case for obviousness. Applicants respectfully request reconsideration of the rejection based on the following comments.

While the Examiner's assertions are reasonable out of context, the Examiner's comments in context do not establish obviousness. First, the Tenne patent does not seem to hint or suggest stirring. Furthermore, the Tenne patent is directed to the formation of nanotubes. It is not clear to Applicants whether or not stirring would be appropriate for reactions directed to the formation of nanotubes. Also, the Examiner has not established that stirring would be appropriate for the formation of nanotubes.

The reactant gases perfuse through a nanoparticulate powder. Improvements resulting from stirring are described and claimed for the formation of silver vanadium oxide particles in U.S. 6,503,646, entitled "High Rate Batteries." It would seem that for nanoparticles the thermal flow is more important than the reactant flow. Uneven heating can result in undesirable results and correspondingly improved results from the use of a stirred reactor. The Tenne application does not raise any of these issues as having significance. Therefore, the Tenne patent also does not modivate the modification.

Since the Tenne patent does not teach, suggest or motivate the stirring of the reactants, the Tenne patent does render Applicants' claim prima facie obvious. Applicants respectfully request withdrawal of the rejection of claim 16 under 35 U.S.C. § 103(a) as being unpatentable over the Tenne application.

Rejection Over Colombet et al.

The Examiner rejected claims 16 and 17 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,279,801 to Colombet et al. (the Colombet patent). The

Examiner asserted that the Colombet patent taught the formation of metal sulfide particles from metal oxide particles having a particle size overlapping with the claimed particle size. The Examiner further asserted that the Colombet patent suggested the claimed process. Applicants' assert that the Colombet patent falls short of suggesting the claimed process such that it does not render Applicants' claimed invention prima facie obvious. Furthermore, to advance prosecution of the claimed invention, Applicants have amended claim 16 to more particularly point out Applicants' claimed invention. Specifically, claim 16 recites that the reactant gases are flowed during the reaction. Applicants respectfully request reconsideration of the rejection based on the following comments.

The current claims recite flowing the reactant gases. However, the Colombet patent teaches away from flowing the reactant gases since the Colombet patent teaches the use of a sealed reactor and stressed the significance of a sealed reactor. Furthermore, with all due respect, the Colombet patent does not suggest or motivate stirring. The Examiner has not provided evidence that the art would recognize for these types of reactions that stirring would be desirable.

In addition, the Colombet patent discusses "grain size." It is not at all clear if the grain size necessarily relates to the particle size. There is not enough information given in the patent to begin to assess what this term means. It could be a crystallite size as distinct from the particle size, which does not necessarily correspond with physical particle size.

Since the Colombet patent teaches away from processing features of the claimed invention, the Colombet patent clearly does not render Applicants' claims prima facie obvious. Applicants respectfully request withdrawal of the rejection of claims 16 and 17 under 35 U.S.C. § 103(a) as being unpatentable over the Colombet patent.

Rejection Over Sanjurjo et al.

The Examiner rejected claims 16, 18, 21, 24 and 25 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,039,894 to Sanjurjo et al. (the Sanjurjo patent). The Examiner asserts that the Sanjurjo patent "suggests the claimed process and particles." Applicants have amended claim 16 to more particularly point out the claimed process. Furthermore, Applicants respectfully assert that there has been a misunderstanding with respect to the teachings in the Sanjurjo patent with respect to the claimed particle collections. Applicants respectfully request reconsideration of the rejections in view of the following comments.

With respect to the method claims, the Sanjurjo patent does not teach or suggest, stirring the particles in a closed container and flowing reactant gases through the container. Therefore, the Sanjurjo patent does not render Applicants' claimed method prima facie obvious.

With respect to the claimed particle collections, the Examiner noted that the Sanjurjo patent taught precursor particles with sizes "of 100 nm up to 1 micron. This means the average particle size is also in this range." However, if the bulk of the particles have a size in the range of 100 nm to 1 micron, the average particle size would be roughly 500 nm to 600 nm, near the midpoint of the range. This is well outside of Applicants particle size range. Therefore, the Sanjurjo patent does not render Applicants' particle collection claims prima facie obvious.

Since the Sanjurjo patent does not render Applicants' claimed prima facie obvoius, Applicants respectfully request withdrawl of the rejection of claims 16, 18, 21, 24 and 25 under 35 U.S.C. § 103(a) as being unpatentable over the Sanjurjo patent.

Rejection Over Hampden-Smith et al.

The Examiner rejected claims 16, 18-22 and 24-26 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,645,398 to Hampden-Smith et al. (the Hampden-Smith

patent). The Examiner asserted that the Hampden-Smith patent "suggests the claimed process and particles." With all due respect, the Hampden-Smith does not teach, suggest or motivate features of Applicants' claimed method for the formation of the particles. With respect to the claimed particle collections, Applicants' have amended claim 18 to more particularly point out their claimed invention. As amended, it is clear that the Hampden-Smith patent does not teach or suggest the claimed invention. Applicants respectfully request reconsideration of the rejection based on the following comments.

With respect to the claimed method, the Hampden-Smith patent teaches roasting under H_2S gas. There is no teaching or motivation to stir the particles during the reaction. Similarly, there is no teaching suggestion or motivation to flow the reactant gases during the reaction. With all due respect, the Examiner's conclusory statements to the contrary with respect to stirring are not supported by evidence that a person of skill in the art would consider stirring appropriate for these types of reactions. Therefore, the Hampden-Smith patent does not render Applicants' claimed method prima facie obvious.

Applicants have amended claim 18 to indicate that the particles have surfaces corresponding to the crystal lattice. In contrast, the particles taught by the Hampden-Smith patent are spherical. See throughout the Hampden-Smith patent. Therefore, the Hampden-Smith patent teaches away from Applicants' presently claimed composition.

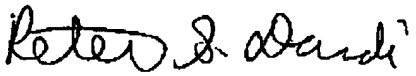
The Hampden-Smith patent does not render any of Applicants' present claims prima facie obvious. Applicants respectfully request withdrawal of the rejection of claims 16, 18-22 and 24-26 under 35 U.S.C. § 103(a) as being unpatentable over the Hampden-Smith patent.

CONCLUSIONS

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



Peter S. Dardi, Ph.D.
Registration No. 39,650

Customer No. 24113
Patterson, Thuente, Skaar & Christensen, P.A.
4800 IDS Center
80 South 8th Street
Minneapolis, Minnesota 55402-2100
Telephone: (404) 949-5730